

11/16/87

ARKANSAS COMPANY SITE SAFETY PLAN
185 FOUNDRY STREET, NEWARK, NEW JERSEY

INTRODUCTION:

The Arkansas Company occupies about two acres of an old and dilapidated industrial park at 185 Foundry Street, Newark, New Jersey. This company manufactured various textile chemicals at this location from 1943 to 1983. The products included chelating agents, dye carriers, emulsifying agents, fire retardants, fungicides, finishes and water repellents.

Abandoned buildings on this site include a two-story office/laboratory building (Bldgs. 25 & 30), a machine shop (Bldg. 26), a small chemical processing building (Bldg. 27), a large four story chemical process building (Bldg. 28), a boiler room/tank house (Bldgs. 16 & 16B), a storage building (Bldg. 24), and two sheds (S1 & S2). About 1500 drums, of which about 600 are empty and 15,000 small containers of chemicals exist in these buildings. In addition, there are approximately 17 aboveground storage tanks and 70 process tanks/reaction vessels.

A. KEY PERSONNEL AND HEALTH AND SAFETY PERSONNEL

The EPA On-Scene Coordinator (OSC) for the Arkansas Site is Mark Pane. The alternate OSCs are John Witkowski and George Zachos, or any other EPA employee as designated by George Zachos. The ERCS Response Manager is Jim Buckland. The designated site safety officer (SSO) is Eugene DiSanto of ERCS. In E. DiSanto's absence the following people will serve as alternates:

1. Jim Buckland
2. Mark Pane
3. Kevin McMann, Regional Safety Officer, ERCS

approval

B. TASK SAFETY AND HEALTH RISK ANALYSIS

1. Sampling/Segregation Operations

All sampling/handling of unknown materials will be performed in level B protection using the buddy system. Periodic air monitoring will take place and communication will be maintained at all times. Samples will be stored and analyzed on-site. Sample waste will be disposed of with site waste. Downgrading of protection levels will be by OSC approval and contingent upon air monitoring and sample analysis results of all unknown materials.

↓ Sign off sheet



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2. Lab Packing Operations

The lab packing operation to take place on site will be performed in two stages using two different levels of personal protection. ERCS will utilize a subcontractor to perform the lab packing. The first stage of the operation will be performed by ERCS in level B protection. This stage of the operation will consist of stockpiling all laboratory containers in a secure and orderly manner on shelving in building 25. The second stage is to be performed by ERCS subcontractor (Chem Waste Management) using level C protection and 5 minute escape packs within easy reach. This stage of the operation will entail the actual packing of lab containers into fiber drums. At this point, all containers will have been identified and categorized. The lab packing area will be well ventilated and have two emergency exits. In addition, ERCS will provide continuous air monitoring using monotox units, an explosimeter, photoionization detector, and radiac unit.

3. Elevator Operating Procedures

Upon recommissioning of the freight elevator in building 28, a policy established that absolutely no personnel are permitted to ride the elevator at any time. The elevator is to be used for the exclusive purpose of transporting drums and any equipment required in the cleanup of building 28. Signs reinforcing this have been posted at the elevator entrance on each of the four floors in building 28.

4. Drum Handling/Bulking Operations

Staging: There are approximately 1600 drums of which about 1000 contain material. All drums will be sampled and staged for bulking. Drum staging will be accomplished by using pallet jacks on all floors above ground. A propane powered forklift will be utilized to transfer drums on the ground floor.

After categorizing the drums of material, they will be opened and the contents will be placed into bulking chambers remotely using a drum grapppler attached to a back hoe. The original drums will be crushed on site. To assure that no contaminants leave the site, the drum will be decontaminated. EPA will secure a subcontractor for the decontaminating and crushing of the empty drums.

Empty drums staged outside will be staged on plastic sheeting. Drums will be washed using a decontamination solution best suited for the contaminants. The use of any solvents will require an additional wash of soap and water.

The use of flammable solvents for decontamination will be discouraged and only used as a last resort. If a flammable solvent is to be used, the Site Safety Officer will first be consulted with and will approve the use of any flammable solvent prior to its uses.

All wash liquid will be properly bulked and containerized for either treatment or disposal. Untreated wash liquids will not be discharged into sewers or drains.

After the drums have been decontaminated, they shall be moved to a staging area. The drum staging area will contain clean plastic for the now clean drums.

The drum staging area will be kept free of debris.

Bulking: The Site Supervisor and Site Safety Officer will ensure that the following procedures are used for the bulking of drum wastes:

Inspection of bulking chambers for any residual materials inside the chamber.

Use of properly rated pumps for hazardous liquids that have a safety relief valve with a splash shield.

Inspection of pump hoses, casings, fittings and gaskets for weak spots and compatibility with material being pumped.

Drum puncturing is done with non-sparking tool.

5. Asbestos Removal

The removal of asbestos from any point at this site, where direct contact is imminent, will be performed by a licensed asbestos contractor and by individuals who have received the required training and are certified to remove asbestos in the state of New Jersey. The asbestos contractor and asbestos workers will be required to present a copy of their respective license/certification.

The licensed asbestos contractor will provide a plan involving the actual methods to be utilized in the removal to the OSC. The OSC and the Site Safety Officer will review and comment on this submitted plan.

ERCS will sample for asbestos in each work area to ensure a non-contaminated working atmosphere.

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6. Sample Analysis

The on-site laboratory will perform compatibility testing on all waste samples extracted from the building. A drum log, denoting possible waste characteristics will be maintained and reviewed by the on-site chemist. The laboratory will have proper ventilation hoods for sample testing and fire extinguishers.

7. Removal of Fire Hazards

Workers shall segregate and dispose of all combustible materials inside the exclusion zone. There will be two classifications roll-offs. One will be used for hazardous and the other for non-hazardous debris. Air monitoring using photoionization detectors, oxygen meters, air bag samples and tenex tubes will be employed.

8. Floor decontamination

Scraping of floors to remove gross residuals will be accomplished using non-sparking scrapers. Scraping will be performed in level C on the buddy system with periodic air monitoring. Communication will be available for this operation. Floor waste will be drummed and sampled for disposal. Liquid floor waste will be vacuumed into drum and sampled for disposal. Final floor decon will be conducted by a subcontractor. The subcontractor will submit a work plan for review and approval by the OSC and the site safety officer. Workers will wear level C protection. All liquid and sludge generated will be collected and disposed of after sampling.

C. EMPLOYEE TRAINING

All personnel on site who enter the exclusion zone will have completed the required OSHA 40 hour training course and the required 3 days of supervised work.

Each person who enters the exclusion zone will read and sign that he/she has read the site safety plan. Each person will be given an initial site familiarization by the site safety officer.

Additionally, daily safety meetings will be held prior to site activity. These meetings emphasize site hazards, the work being undertaken that day, and any special safety announcements for that day. Personnel are afforded the opportunity to voice concerns at this daily safety meeting. Records of daily safety meetings are maintained in the site safety log.

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D. PERSONAL PROTECTIVE EQUIPMENT

All site personnel will be trained in the proper use of personal protective equipment. The following table illustrates the OSHA standards to be followed for use of personal protective gear:

PROTECTION	REGULATION	SOURCE
General	29 CFR Part 1910.132	41 CFR Part 50-204.7 General Requirements for Personal Protective Equipment.
	29 CFR Part 1910.1000	41 CFR Part 50-204.50, except for Table Z-2, the source of which is American National Stan- dards Institute, Z37 series.
	29 CFR Part 1910.1001-1045 29 CFR Part 1910.120	OSHA Rulemaking. Hazardous Waste Operations
Eye and Face	29 CFR Part 1910.133(a)	ANSI Z87.1-1968 Eye and Face Protection
Noise Exposure	29 CFR Part 1910.95	41 CFR Part 50-204.10 and OSHA Rulemaking
Respiratory	29 CFR Part 1910.134	ANSI Z89.2-1969 Standard Practice for Respiratory Protection
Head	29 CFR Part 1910.135	ANSI Z89.1-1969 Safety Requirements for Indus- trial Head Protection
Foot	29 CFR Part 1910.136	ANSI Z41.1-1967 Men's Safety Toe Footwear
Electrical Protective Devices	29 CFR Part 1910.137	ANSI Z89.4-1968 Ventil- ation and Safe Practice for Abrasive Blasting Operations

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(At a minimum,) level C personal protection will be used in the exclusion zones.

Level C personal protection will be used where type and concentrations of atmospheric contaminants are known and where liquid splashes or other direct contact will not adversely affect any exposed skin and when the criteria for air purifying respirators have been met. Level C protection includes the following at a minimum:

Tyvek coveralls, tyvek hood, latex gloves, vinyl booties, safety shoes, full-face air-purifying respirators with cartridges approved for organic vapors and equipped with a high efficiency particulate air (HEPA) filter, safety hard hat and all joints taped with duct tape.

Level B personal protection will be used where type and concentrations of atmospheric contaminants are unknown or have been identified but require a high level of respiratory protection. Level B protection includes the following at a minimum:

Tyvek coveralls, tyvek hood, Saranex outer garment, vinyl booties, latex gloves, PVC or nitrile gloves, safety hard hat, safety shoes, self contained breathing apparatus (SCBA) operating in positive pressure and all joints taped with duct tape.

Personal Protective Equipment Guidelines:

1. All site personnel unable to pass a fit test as a result of facial hair or facial configuration will not enter or work in any exclusion zone.
2. All level D personnel entering any point at or beyond the transition shed will wear hardhats and safety glasses.
3. Respiratory equipment will be used by all site personnel whenever they are in any exclusion zone.

See part G. on PPE for specific site tasks.

E. MEDICAL SURVEILLANCE REQUIREMENTS

All personnel assigned to the site will, at a minimum, be required to undergo a physical examination in accordance with EPA medical monitoring requirements.

Each contractor on site will be responsible for maintenance of their employees' records and will be responsible for medical monitoring of their employees.

Over the course of on-site activities a significant range of weather conditions are expected. In response to this it will be the responsibility of the site health and safety officer to ensure that the proper safeguards to protect against heat stress, hypothermia, and frostbite are followed. (see attachments)

F. AIR MONITORING AND PERSONNEL MONITORING

During the progress of drum handling/staging, preparing for and conducting lab packing operations and bulking of drum wastes, the contractor will monitor the quality of air in and around each location. Air sampling will be conducted on a regular basis and additionally as required by special or work related conditions.

Air monitoring instruments will include an explosimeter, organic vapor analyzer (OVA) and a photoionization detector (PID). Air monitoring equipment will be operated only by trained personnel.

The contractor will maintain a daily log of the location, time, type, and value of each reading and/or sampling. Copies of daily log sheets will be provided to OSC and may be viewed by site personnel upon request.

If organic vapor levels of unknown chemicals in ambient air exceed three times any background reading, or two times background for any two successive readings, or if the explosimeter indicates over 10% of the lower explosive limit on any single reading, then that work location will be shut down.

Regular background air monitoring will be performed to determine if air leaving the exclusion zone or contamination reduction zone poses a threat to residents or other persons around the site. The action levels for corrective action will be two times background levels.

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Personnel monitoring:

Selective monitoring of high risk workers, i.e. those closest to the source of contaminant generation will be conducted. Personal monitoring samples will be collected in the breathing zones of workers to represent their potential inhalation exposure. Pumps will be protected with plastic covering to make facilitate decontamination procedures.

Known Chemical Hazards:

The following is a list of the sixteen identified waste streams on site:

- | | |
|-------------------------|---------------------------------|
| 1. base/neutral liquids | 9. oxidizer liquids |
| 2. base/neutral solids | 10. oxidizer solids |
| 3. acid liquids | 11. organic liquids |
| 4. acid solids | 12. organic solids |
| 5. cyanide liquids | 13. flammable solids |
| 6. cyanide solids | 14. flammable liquids |
| 7. peroxide liquids | 15. reactive solids |
| 8. peroxide solids | 16. halogenated organic liquids |

See attachment for additional list of specific compounds which present special hazards.

G. SITE CONTROL MEASURES

1. Site Security

Site security will be provided by the contractor for all personnel entering the site. The names and affiliations of all individuals entering the site will be maintained by the site security.

2. Site Work Zones

To reduce the spread of contamination by workers from the contaminated area, exclusion, contamination reduction and support zones will be delineated and defined as follows:

Exclusion Zone, the contaminated area, is the inside of all buildings on site and where the bulking of wastes is to occur behind building 28. Each building has one access control point which is used for entering and exiting into the exclusion zones. The northwest section of bldg. 28, the location of the freight elevator, will not be considered part of the exclusion zone and will be kept free of debris and contaminants.

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Level C protection is the minimum allowable level required by all site personnel entering any exclusion zone. However, level B protection will be required when handling drums of unknown materials and full drums that are in poor condition, during bulking operations, during cleaning of basement in building 25 and during staging of all laboratory chemicals to prepare for lab packing.

The contamination reduction zone (CRZ) is the area where decontamination of personnel and equipment takes place. It is the area within a few feet from the access control points inside the buildings.

The support zone begins at the transition shed which contains supplies of protective gear, first aid kit and sign-in sheets for the exclusion zone. All site personnel may wear work clothes within this zone. A shower trailer, two office trailers and a fire zone are contained in the support zone. Support zone personnel are responsible for alerting the proper agency in the event of an emergency.

H. DECONTAMINATION PROCEDURES

All personnel, equipment and samples leaving any contaminated area on-site must be properly decontaminated by physically removing contaminants by scrubbing or scraping, water rinse or disposal of outer garments and protective coverings.

An emergency shower will be placed in the decontamination areas; the two decontamination showers have been placed just inside bldg. 28 adjacent to the egress area, and outside the egress shed from bldg. 25 (D1).

Emergency decontamination is addressed under Section K-Site Emergency Response Plan.

See attachment for location and description of the measures for level B & C decontamination.

I. SITE STANDARD OPERATING PROCEDURES

As new phases of the removal action at this site occur that have not been previously addressed, an addendum to the site safety plan will be included once approved by the OSC and the Site Safety Officer.

All personnel will be made aware of the following standing orders for this site:

1. No smoking, eating or drinking in the exclusion or contamination reduction zones.

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2. No matches, lighters, or any flames of any kind in these zones.
3. Sign in on the exclusion zone entry sheet before entering and sign out upon exiting.
4. Always enter exclusion zone with a buddy.
5. If any signs of radioactivity, explosivity, or unusual conditions are discovered, they should be reported to the site supervisor and site safety officer immediately.
6. No parking in the established fire zone. All cars in the support zone will be parked so as to allow the quickest exit from the site.
7. Communication: The Health and Safety Officer (HSO) will be the responsible individual for determining the proper methods of communication at the site. The HSO shall also be responsible for instructing all participants in the preliminary site entry in the use of the selected communication method(s).

Each member of the site entry team shall be able to communicate with another entry team member at all times.

Communications may be via the following methods:

- SOUND (air horn)
- ELECTRONIC (radio, bull horn)
- VISUAL (hand signals)

** The following standard hand signals shall be mandatory for all employees regardless of other means of communications.

Hand Gripping Throat.....Out Of Air, Can't Breathe
Hands On Top Of Head.....Need Assistance
Thumbs Up.....OK, I'm alright, I understand
Thumbs Down.....No, Negative
Gripping Partner's Wrist
Or Gripping Both Hands on
Wrist.....LEAVE AREA IMMEDIATELY!

8. For the purpose of site work, the exclusion zone will consist of inside all site buildings and the bulking area behind building 28. Other exclusion zones will be denoted in the daily site safety meetings and added to the site safety plan as they are delineated.

J. CONFINED SPACE ENTRY

The Arkansas Chemical Facility does not have any areas which can be classified as areas of "confined space entry", as defined under OSHA regulations. However, if any scope of work undertaken at this facility were to include an area defined as a confined space entry, all safety protocol would be followed in accordance with OSHA regulations.
(see attachments)

K. SITE EMERGENCY RESPONSE PLAN

1. PRE-EMERGENCY PLANNING

Prior to activities at the Arkansas Chemical Company all appropriate authorities and agencies have been notified as to the nature of work to be performed. The following list details notified parties and their corresponding telephone numbers:

NEWARK FIRE DEPARTMENT.....733-7400
NEWARK POLICE DEPARTMENT.....733-6290
ST. JAMES HOSPITAL.....589-1300
UNIVERSITY OF MEDICINE AND DENTISTRY
OF NEW JERSEY (UMDNJ)
EMERGENCY MEDICAL SERVICE.....456-6290

The directions to St. James are as follows: From the site make left onto Foundry Street and follow until Raymond Blvd. Turn left onto Raymond Blvd. Follow approximately 1.3 miles to Gulf Station on left. Turn left (sharp turn) onto Market Street. Make an immediate right turn onto Monroe Street. Follow Monroe Street for about three blocks to Lafayette Street. Turn right onto Lafayette and follow three blocks to Congress Street. Turn left onto Congress Street. Emergency room entrance is immediately on left side of Congress Street. (see attachment for map)

2. PERSONNEL ROLES/TRAINING, COMMUNICATIONS, AND AUTHORITY LINE

a. All key personnel, their corresponding role during an emergency, and their place in the chain of custody are listed in section A of the site safety plan.

b. Details of training required by all on-site personnel can be found in section C of the site safety plan.

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c. The line of communication required between all on and off site personnel during an emergency is as follows:

- * The primary person realizing that a state of emergency exists will immediately notify the command post (CP).
- * Upon notification, the CP will contact all emergency response units and other appropriate authorities including the OSC and ERCS Response Manager.

3. EMERGENCY RECOGNITION AND PREVENTION

On a daily basis all personnel on site will attend a briefing prior to any exclusion zone activities. At this meeting discussions shall include the following:

- a. Tasks to be performed.
- b. Time constraints (i.e., rest breaks, air tank changes).
- c. Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals.
- d. Emergency procedures.

Following daily work assignments a debriefing session should be held to review work accomplished and problems observed.

4. SAFE DISTANCES AND PLACES OF REFUGE

Due to the range of chemicals found on site and various other factors (i.e., wind speed, size of release, topography) it is unreasonable to think that any one plan will satisfy the requirements for all potential emergencies. In response to this it is determined that in the event of an emergency all personnel shall exit to a "safe" area determined by the nature of the emergency and await instruction from on-site management personnel.

5. SITE SECURITY AND CONTROL

In the event of an emergency it is imperative that the production manager is aware of the location of all personnel and their respective tasks being performed. To aid in the establishment of such a policy, a list of the following factors shall include but not be limited to:

- a. Anticipated entry/exit times.
- b. Use of "buddy" system.
- c. System by which to locate all personnel immediately when necessary.
- d. Nature of tasks and area where performed.

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6. EVACUATION ROUTES AND PROCEDURES

In the event that a severe emergency occurs and the established entrance/egress routes are cut off, the following routes should be attempted:

- a. 1st floor of bldg. 25: double doorway facing bldg. 28
- b. 2nd floor of bldg. 25: fire escape at far office on south side of bldg.
- c. Bldg. 30: emergency exit door on south side of bldg.
- d. 1st floor of bldg. 30A: door at east end of bldg.
- e. 2nd floor of bldg. 30A: fire escape on south side of bldg.
- f. 1st floor of bldg. 28: door at rear of bldg. 28b or garage door at rear of bldg. 28

7. DECONTAMINATION

In addition to routine decontamination procedures it may be necessary to perform the emergency decontamination of personnel. In the event of such an incident the following factors shall be considered:

- * When medical treatment is required to save a life decontamination should be delayed until victim is stabilized.
- * Decontamination should be performed immediately when:
 - 1. It does not interfere with essential life saving techniques or first aid.
 - 2. Worker has been contaminated with corrosive or toxic material that could cause further harm.
- * When emergency is a heat related illness the protective clothing will be removed as soon as possible to reduce further heat stress.

8. EMERGENCY MEDICAL TREATMENT AND FIRST AID

As established by section 1 of the site safety plan, first aid stations and emergency medical phone numbers have been positioned at established points throughout the site. As per Standard Operating Procedures (SOP), any injuries or exposures shall be treated as worst case scenarios until a time that qualified personnel can assess the situation and make the appropriate judgement of the individual situation.

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9. EMERGENCY ALERTING AND RESPONSE PROCEDURES

In the event that an emergency situation does occur the following sequence is to be undertaken:

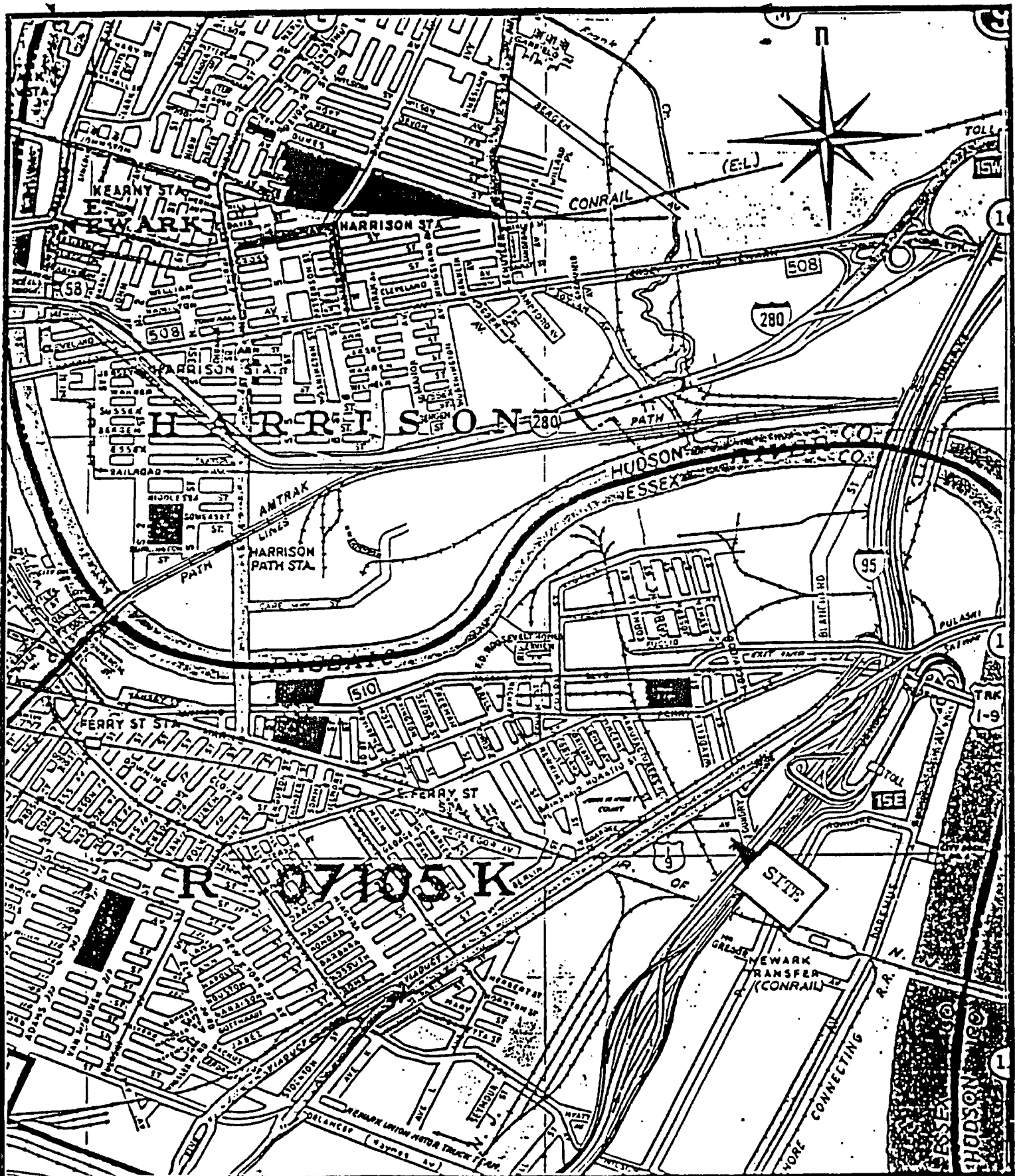
- a. Notify personnel and inform them of incident details.
- b. Evaluate situation (i.e., what happened, who was involved).
- c. Respond to needs of personnel involved (i.e., request aid, extricate, evacuate).
- d. Follow up incident by notifying appropriate agencies and plan contingencies for future such incidents.

10. CRITIQUE OF RESPONSE AND FOLLOW-UP

Upon final conclusion of incident the key personnel on site (i.e., OSC, HSO) will investigate and document the incident in an accurate, authentic, and complete manner.

11. PERSONAL PROTECTIVE EQUIPMENT (PPE) AND EMERGENCY EQUIPMENT

During an emergency situation all personnel will, at a minimum, adhere to all existing exclusion zones for degrees of PPE. In addition to this, emergency equipment (i.e., emergency escape packs, SCBAs, first aid kits) has been placed at the main egress points from bldgs. 25 and 28.



WESTERN

SPILL PREVENTION &
EMERGENCY RESPONSE DIVISION

EPA PM
M. Pane

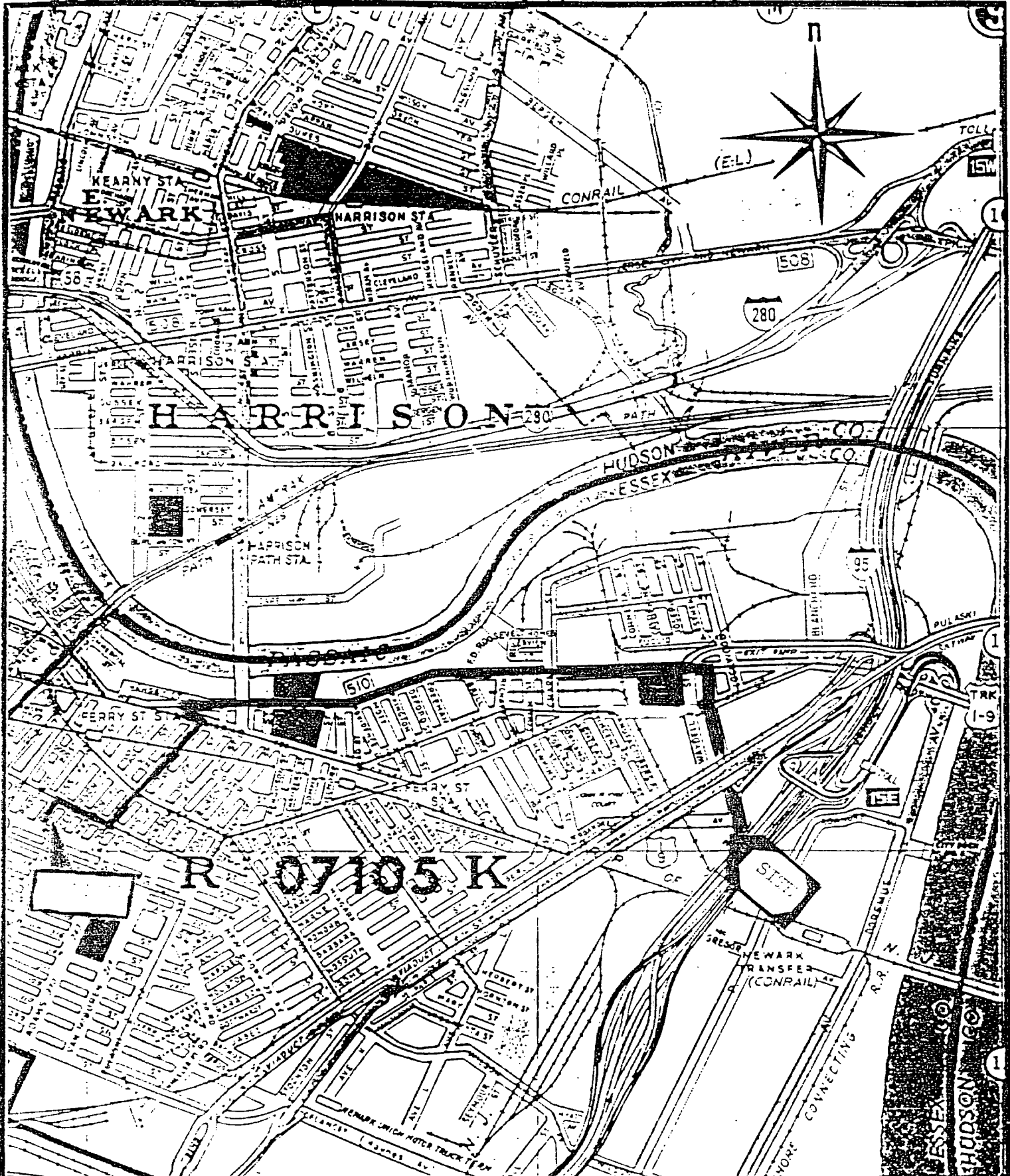
Arkansas Chemical
Site Map

In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.

TAT PM
D. Graham

Figure 1

ROUTE TO ST. JAMES HOSPITAL



WESTON

SPILL PREVENTION &
EMERGENCY RESPONSE DIVISION

EPA PM

N. June

Arkansas Chemical
Site Map

In Association with: Technology Inc., C.C. Johnson & Associates,
Inc., Resource Consultants, Inc., and Resource Consultants, Inc.,
and Environmental Technology International, Inc.

TAT PM

SAFETY FENCE /+++++/

D1 : DECON AREA 1
D2 : DECON AREA 2
E1 : EQUIPMENT SHED
SS : SAFETY SHOWER
ESCB : EMERGENCY SCBA
~~E~~ : EMERGENCY EXITS

SAFETY FENCE /+++++/

D1 : DECON AREA 1
D2 : DECON AREA 2
E1 : EQUIPMENT SHED
SS : SAFETY SHOWER
ESCB : EMERGENCY SCBA
~~E~~ : EMERGENCY EXITS

16

24

BULKING AREA

S2

288

28

52

32

02

27

26

E1

D1

25-

101

ESDA

SS

TRANSITION
SHED

30

30A

FIRE LANE

MOBILE LAB

DECON

BREAK TRAILER

AUTOMATIC ELECTROPLATING

SUN CHEMICAL

EXIT

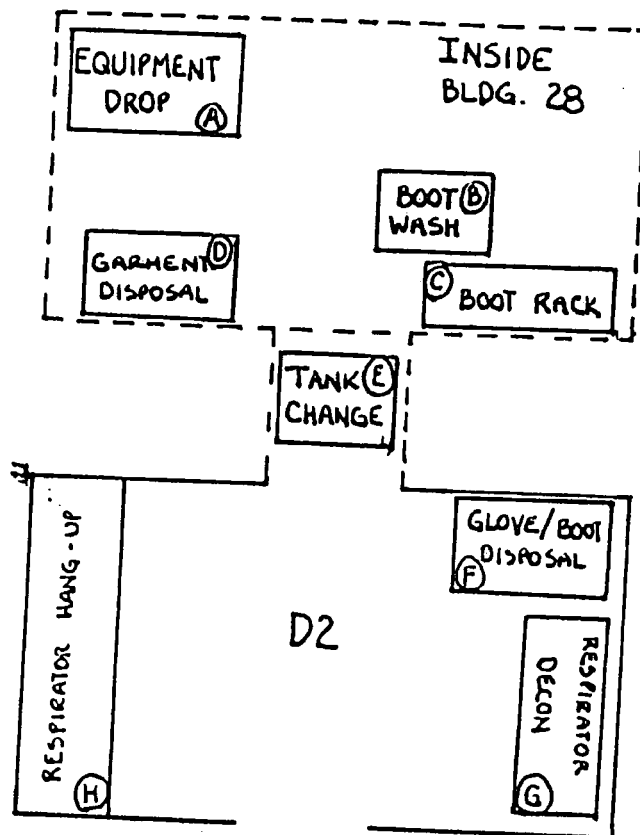
31

ERCS

**EPA
COMMAND
POST**

SECURITY

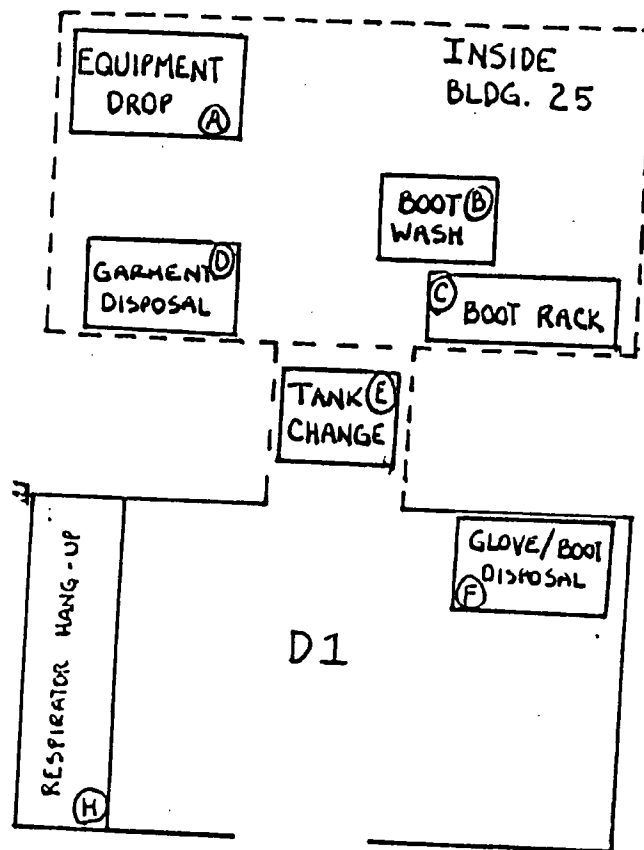
BUILDING 28 LEVEL B & C DECON



- (A) DROP OFF ALL EQUIPMENT THAT WILL BE RE-USED INSIDE THE HOT-ZONE
- (B) OUTER BOOT WASH STATION
- (C) OUTER BOOT RACK. USED AT THE COMPLETION OF DAILY ACTIVITIES
- (D) GARMENT (TYVEK OR SARAN) DISPOSAL STATION. OUTER GLOVES ALSO DISPOSED HERE
- (E) SCBA TANK CHANGE POINT. USED WHEN CONTINUING HOT ZONE WORK
- (F) DISPOSABLE BOOTS / GLOVES STATION. RESPIRATOR REMOVED
- (G) 4 STEP RESPIRATOR DECON. ① WASH ② RINSE ③ BLEACH WASH ④ RINSE
- (H) RESPIRATOR STORAGE LINE

NOTE: WHEN CONTINUING HOT ZONE WORK, DECON PROCEDURES ARE (A) (B) & (F)
 LEVEL C DECON WILL INCLUDE STEPS (A) THRU (H) EXCEPT FOR (E)

BUILDING 25 LEVEL B & C DECON



- (A) DROP OFF ALL EQUIPMENT THAT WILL BE RE-USED INSIDE THE HOT-ZONE
- (B) OUTER BOOT WASH STATION
- (C) OUTER BOOT RACK. USED AT THE COMPLETION OF DAILY ACTIVITIES
- (D) GARMENT (TYVEK OR SARAN) DISPOSAL STATION. OUTER GLOVES ALSO DISPOSED HERE
- (E) SCBA TANK CHANGE POINT. USED WHEN CONTINUING HOT ZONE WORK
- (F) DISPOSABLE BOOTS / GLOVES STATION. RESPIRATOR REMOVED
- (G) 4 STEP RESPIRATOR DECON. ① WASH ② RINSE ③ BLEACH WASH ④ RINSE. PERFORMED IN D2.
- (H) RESPIRATOR STORAGE LINE

NOTE: WHEN CONTINUING HOT ZONE WORK, DECON PROCEDURES ARE (A) (B) & (F)
 LEVEL C DECON WILL INCLUDE STEPS (A) THRU (H) EXCEPT FOR (E)

MINIMUM MEASURE FOR LEVEL B DECONTAMINATION

- | | |
|--|---|
| Station 1: Equipment Drop: | 1. Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down station may be set up within this area. |
| * Station 2: Outer Garment, Boots, and Gloves Wash and Rinse | 2. Scrub outer boots, outer gloves and chemical - resistant splash suit with decon solution or detergent water. Rinse off using copious amounts of water. |
| Station 3: Outer Boot and Glove Removal | 3. Remove outer boots and gloves. Deposit in container with plastic liner. |
| Station 4: Tank Change | 4. If worker leaves exclusive zone to change air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty. |
| Station 5: Boots, Gloves and Outer Garment Removal | 5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic. |
| Station 6: SCBA Removal | 6. SCBA backpack and facepiece is removed. Avoid touching face with finger. SCBA deposited on plastic sheets. |
| Station 7: Field Wash | 7. Hands and face are thoroughly washed. Shower as soon as possible. |
- * Station 2 (outer wash) to be utilized for non disposable clothing and/or obvious contamination on disposable outer clothing.

MINIMUM MEASURE FOR LEVEL C DECONTAMINATION

- | | |
|--|---|
| Station 1: Equipment Drop: | 1. Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down station may be set up within this area. |
| * Station 2: Outer Garment, Boots, and Gloves Wash and Rinse | 2. Scrub outer boots, outer gloves and splash suit with decon solution or detergent water. Rinse off using copious amounts of water. |
| Station 3: Outer Boot and Glove Removal | 3. Remove outer boots and gloves. Deposit in container with plastic liner. |
| Station 4: Canister or Mask Change | 4. If worker leaves exclusion zone to change canister (or mask) this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty. |
| Station 5: Boots, Gloves and Outer Garment Removal | 5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic. |
| Station 6: Face Piece Removal | 6. Facepiece is removed. Avoid touching face with finger. Facepiece deposited on plastic sheet. |
| Station 7: Field Wash | 7. Hands and face are thoroughly washed. Shower as soon as possible. |
- * Station 2 (outer wash) to be utilized for non disposable clothing and/or obvious contamination on disposable outer clothing.

ANNEX 1

HYPOTHERMIA AND FROSTBITE

Chart

A. Symptoms:

When exposed to cold temperature and/or cold water, the body reacts instinctively in a pattern designed to preserve itself. It resorts to involuntary reactions originating in the brain. When the brain recognizes any dangerous temperature drop in the body core, it signals the body to make adjustments to compensate for the imbalance. First, in an attempt to preserve normal temperatures in the vital internal organs, the blood vessels in the extremities constrict (vasoconstriction). This slows the blood flow to the arms and legs, preserving that energy and warm blood for the body core. If there is continued heat loss and if the body core temperature drops below 95°F (35°C), the body then tries to generate more heat through shivering, which causes metabolic heat production to increase to several times the normal rate. This is the first real warning sign of hypothermia. Further heat loss, accompanied by a body core temperature drop to 90°F (32.2°C) or below, results in speech difficulty, loss of manual dexterity, slow reactions, mental confusion and muscle rigidity (muscle hypertonus). If exposure continues further until the body's resources are exhausted and if the cold blood reaches the heart and the brain, heart failure and coma will result and lead inevitably to death. Death occurs when the body core temperature falls below 78°F (25.6°C).

If exposure occurs in temperatures which are below freezing (30°F or below), frostbite or trench foot (immersion foot) may accompany or complicate the symptoms of hypothermia. Frostbite is the freezing of living tissues with a resultant breakdown of cell structure. Injury due to frostbite may range from superficial redness of the skin, slight numbness and blisters, to the obstruction of blood flow (ischemia), blood clots (thrombosis) or skin discoloration due to insufficient oxygen in the blood (cyanosis). Frostbite may occur if the skin comes into contact with objects whose surface temperature is below freezing, such as metal tool handles. Trench foot is caused by continuous exposure to cold combined with persistent dampness or immersion in water. Injuries in this case include permanent tissue damage due to oxygen deficiency, damage to capillary walls, severe pain, blistering, tissue death and ulceration. Additionally, cold exposures may either induce or intensify vascular abnormalities. These include chilblain (a swelling or sore), Raynaud's disease, acrocyanosis (blueness of hands and feet) and thromboangiitis (inflammation of the innermost walls of blood vessels with accompanying clot formation). Workers suffering from these ailments should take particular precautions to avoid chilling.

Hypothermia damages both the body's internal temperature mechanisms (hypothalamus) and the peripheral mechanisms to prevent heat loss (vasoconstriction and perspiration). These effects may last up to three years.

B. Treatment:

If hypothermia occurs, certain first aid procedures can mean the difference between life and death for the victim. These include the following (as a general rule, treat all injuries in the order of their importance to preserving life):

For Hypothermia:

1. Give artificial respiration and stop any bleeding, if necessary.
2. Bring the victim into a warm room or shelter as quickly as possible.
3. If the victim cannot be moved (spinal injury, etc.) carefully place newspapers, blankets or some other insulation between him and the ground.
4. Remove all wet clothing.
5. Provide an external heat source, for the body cannot generate its own heat. Wrap the victim in prewarmed blankets, place him or her in the liner of a portable hypothermia treatment unit, put the torso (not the extremities) into a tub of warm water or use body-to-body contact to rewarm the body core. These measures will slowly reopen the peripheral circulation so as to minimize the possibility of after-shock or after-drop (the flowing of cooled, stagnated blood from the limbs to the heart), which may cause ventricular fibrillation, cardiac arrest or death.
6. Do not allow the victim to sleep.
7. Give warm, sweet drinks -- no alcohol or pain relievers.
8. Keep the victim still. Do not try to walk.
9. Do not rub numb skin.
10. Get medical help as soon as possible.

For Frostbite:

1. Wrap the victim in woolen cloth and keep dry until he or she can be brought inside.
2. Do not rub, chafe or manipulate frozen parts.
3. Bring the victim indoors.
4. Place the victim in warm water (102° to 105°F) and make sure it remains warm. Test the water by pouring it on the inner surface of your forearm. Never thaw affected parts if the victim has to go back out into the cold. The affected area may be refrozen.
5. Do not use hot water bottles or a heat lamp, and do not place the victim near a hot stove.
6. Do not allow the victim to walk if his or her feet are affected.
7. Have the victim gently exercise the affected parts once they are thawed.
8. Seek medical aid for thawing of serious frostbite, because the pain will be intense and tissue damage will be extensive.

ANNEX I

HEAT STRESS

Effects of Heat Stress

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, movement) to fatal. Standard reference books should be consulted for specific treatment.

Heat-Related Problems Are:

Heat Rash: Caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.

Heat Cramps: Heat cramps usually affect people who work in hot environments and perspire a great deal. Loss of salt from the body causes very painful cramps of the leg and abdominal muscles. Heat cramps may also result from drinking iced water or other drinks either too quickly or in too large a quantity. The symptoms of heat cramps are as follows:

- Muscle cramps in legs and abdomen
- Pain accompanying cramps
- Faintness
- Profuse perspiration

To provide emergency care for heat cramps, remove the patient to a cool place. Give him sips of liquids such as "Gatorade" or its equivalent. Apply manual pressure to the cramped muscle. Remove the patient to a hospital if there is any indication of a more serious problem.

Heat Exhaustion

Heat exhaustion occurs in individuals working in hot environments; this disorder may be associated with heat cramps. It is brought about by the pooling of blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The skin vessels become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when in an upright position, may lead to an

inadequate return of blood to the heart and eventually to physical collapse. The symptoms of heat exhaustion are as follows:

- Weak pulse
- Rapid and usually shallow breathing
- Generalized weakness
- Pale, clammy skin
- Profuse perspiration
- Dizziness
- Unconsciousness
- Appearance of having fainted (the patient responds to the same treatment administered in cases of fainting)

To provide emergency care of heat exhaustion, remove the patient to a cool place and remove as much clothing as possible. Administer cool water, "Gatorade" or its equivalent. If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling. Treat the patient for shock, and remove him to a medical facility if there is any indication of a more serious problem.

Heat Stroke

Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness and even death. Direct exposure to sun, poor air circulation, poor physical condition, and advanced age (over forty) bear directly on the tendency to heat stroke. It is a serious threat to life and carries a twenty percent mortality rate. Alcoholics are extremely susceptible. The symptoms of heat stroke are as follows:

- Sudden onset
- Dry, hot and flushed skin
- Dilated pupils
- Early loss of consciousness

- Full and fast pulse
- Breathing deep at first, later shallow and even almost absent.
- Muscle twitching, growing into convulsions.
- Body temperature reaching 105 to 106 degrees or higher.

When providing emergency care for heat stroke, remember that this is a true emergency. Transportation to a medical facility should not be delayed. Remove the patient to a cool environment if possible, and remove as much clothing as possible. Assure an open airway. Reduce body temperature promptly by dousing the body with water, or preferably by wrapping in a wet sheet. If cold packs are available place them under the arms, around the neck, at the ankles, or any place where blood vessels that lie close to the skin can be cooled. Protect the patient from injury during convulsions, especially from tongue biting.

Heat Stress Monitoring:

All supervisors should ensure that their personnel are briefed on the hazards, symptoms, and treatment of heat related problems.

For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism. Monitoring of personnel wearing impervious clothing should commence when the ambient temperature is 70°F or above. Frequency of monitoring should increase as the ambient temperature increases or as slow recovery rates are indicated. When temperatures exceed 85°F, workers should be monitored for heat stress after every work period.

- a) Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be shortened by 33%.
- b) Body temperature should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the

beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the OT exceeds 99.7°F at the beginning of the next period, the following work cycle should be further shortened by 33%. OT should be measured again at the end of the rest period to make sure that it has dropped below 99°F.

- c) Body water loss (BWL) due to sweating should be measured by weighing the worker in the morning and in the evening. The clothing worn should be similar at both weighings; preferably the workers should be nude. The scale should be accurate to plus or minus 1/4 lb. BWL should not exceed 1.5% of the total body weight. If it does, the worker should be instructed to increase his daily intake of fluids by the weight lost. Ideally, body fluids should be maintained at a constant level during the work day. This requires replacement of salt lost in sweat as well.
- d) Good hygienic standards must be maintained by frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

HEAT STRESS PREVENTION:

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries. To avoid heat stress, management should take the following steps:

- ° Adjust work schedules:

Modify work/rest schedules according to monitoring requirements.

Mandate work slowdowns as needed.

Rotate personnel: alternate job functions to minimize overstress or overexertion at one task.

Add additional personnel to work teams.

Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

- ° Provide shelter (air conditioned, if possible) or shaded areas to protect personnel during rest periods.

- ° Maintain workers' body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat [14]. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

Maintain water temperature at 50° to 60°F (10° to 15.6°C).

Provide small disposable cups that hold about 4 ounces (0.1 liter).

Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.

Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

Weigh workers before and after work to determine if fluid replacement is adequate.

- ° Encourage workers to maintain an optimal level of physical fitness:

Where indicated, acclimatize workers to site work conditions: temperature, protective clothing, and workload.

Urge workers to maintain normal weight levels.

- ° Provide cooling devices to aid natural body heat exchange during prolonged work to severe heat exposure. Cooling devices include:

Field showers or hose-down areas to reduce body temperature and/or to cool off protective clothing.

Cooling jackets, vests, or suites (see Table 8-5 for details).

- ° Train workers to recognize and treat heat stress. As part of training, identify the signs and symptoms of heat stress.

* Excerpted from Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, 1985.

G -- SAFE CONFINED SPACE ENTRY PROCEDURE
MAINTENANCE OPERATIONS

NOTE: NO CONFINED AREA WILL BE ENTERED UNTIL THESE PROCEDURES ARE FOLLOWED. UNAUTHORIZED ENTRY INTO A CONFINED SPACE IS BASIS FOR EMPLOYMENT TERMINATION.

Before a tank can be entered for maintenance, it must be properly cleaned, flushed and drained of all liquids and/or solids. (Also see Set-up and Vessel Cleaning procedures).

1. Isolate the tank or vessel from service. Isolation includes:

- a. Blank-off or disconnect all utility and process lines which are directly or indirectly connected to vessel.

NOTE: Isolation is either blanking or disconnection. A closed valve is not acceptable isolation.

- b. Agitators must be locked out. (See lockout procedures).

NOTE: At least two locks are involved here: one by the operations supervisor authorizing the Permit and a second by a individual actually entering the confined space.

- c. Blanked lines and agitators must be tagged according to tag out procedure. (See tag out procedures).

2. Open vessel manheads.

3. Assure that the vessel is satisfactorily cleaned.

4. Vent Vessel - two (2) openings are recommended where possible for ventilation. Forced drafting will be provided as necessary.

5. Pre-Entry Requirements.

- a. The Safety watch responsibility must be assigned to a specific individual.

- b. Hand held horn (three (3) shorts indicate need of help) for use by safety watch.

NOTE: Personnel in the area must be informed of the entry activity in order that they can properly respond in the event of the horn being sounded.

- c. Safety harness for individual entering the confined space.

- d. Lifeline tied to stationery object outside vessel.

6. Complete Safe Entry Permit (See Safety Coordinator or Site Operations Manager).

- a. Verify the checklist items on the confined space entry permit tag. Do

all test required on this tag and record on tag.

- b. Permit may be time restricted depending on conditions (Record on tag).
 - c. White copy of tag is given to safety officer. Green copy of tag posted on area awareness board, trailer or truck. Hard copy is hung at opening at point of entry.
 - d. The safety watch must attend the life line of the individual inside the confined space at all times. The safety watch may not enter the confined space and may not leave his post.
7. If Entry is for repair which requires hot work, then a Hot Work permit must also be secured.

CAUTION: If welding is to be done in a confined space, then fresh air must be forced into the confined space. This is to assure removal of welding gases. Shielding gases (ex: argon) are inert, but welding itself can produce toxic gases.

8. Other personnel protection equipment are prescribed for each job depending upon the hazard assesment of that job.

CONFINED SPACE ENTRY

A. Purpose

To establish the requirements for safe entry into, continued work in and exit from confined spaces.

B. Definitions

1. Confined Space - A space or work area which is not designed or intended for normal human occupancy, having limited means of egress and poor natural ventilation, and which may contain physical hazards, atmospheric contaminants, and/or oxygen deficiency.
2. Atmosphere Immediately Dangerous to Life or Health (IDLH) - An atmosphere which contains insufficient oxygen or an elevated level of contaminants which may render a person incapable of self-rescue.
3. Atmosphere Not Immediately Hazardous to Health - An atmosphere in which an employee could safely exit from an area without requiring any personal protective equipment.
4. Combustible Gas/Oxygen Monitoring Device - A single unit device that will monitor both combustible gas and oxygen levels and is equipped with an audible alarm that will activate at preset levels to warn personnel of a possible unsafe, deficient atmosphere.
5. Confined Space Entry Permit - A document to be initiated by the supervisor of personnel required to work in a confined space. The Confined Space Entry Permit (CSEP) will be completed by the Health and Safety Department (or its designated representative) before personnel are allowed to enter the confined space. The CSEP shall be valid only for the performance of work identified and for the location and time specified. The beginning of a new shift with change of personnel will require the issuance of a new CSEP.
6. Confined Space Observer - An individual assigned to monitor the activities of personnel working within a confined space. The confined space observer summons rescue personnel in the event of emergency and assists the rescue team.

C. General

1. Health and Safety (or its designated representative) has the responsibility to issue the CSEP, to evaluate and monitor work performed within a confined space for possible hazards, and to determine the safety procedures, personal protective and rescue equipment required.
2. When possible, Confined Spaces should be identified with a posted

sign, "Caution-Confined Space."

3. Only personnel trained and knowledgeable of the requirements of this Instruction will be authorized to enter a confined space or be a confined space observer.
4. A Confined Space Entry Permit (CSEP) must be issued prior to the performance of any work within a confined space.
5. Natural ventilation shall be provided for the confined space prior to initial entry of personnel and for the duration of the CSEP. Positive/forced mechanical ventilation may be required. However, care should be taken to not spread contamination outside of enclosed area.
6. If flammable liquids may be contained within the confined space, explosive proof equipment will be used. All equipment shall be positively grounded.
7. The contents of any confined space shall, where necessary, be removed before any person enters. All sources of ignition must be removed prior to entry.
8. Hand tools used in confined spaces shall be in good repair, explosion proof and spark proof, and selected according to intended use. Where possible, pneumatic power tools are to be used.
9. Hand-held lights and other illumination utilized in confined spaces shall be equipped with guards to prevent contact with the bulb and must be explosion-proof.
10. Compressed gas cylinders, except cylinders used for self-contained breathing apparatus, shall not be taken into a confined space. Gas hoses shall be removed from the space and the supply turned off at the cylinder valve when personnel leave the confined space.
11. If a confined space requires respiratory equipment or where rescue may be difficult, safety belts, body harnesses, and lifelines will be used. The outside observer will be provided with the same equipment as those working inside.
12. Smoking in confined spaces will be prohibited at all times.
13. Only National Institute of Occupational Safety and Health (NIOSH) approved, self-contained breathing apparatus, or NIOSH approved airline respirators equipped with a 5-minute emergency air supply (egress bottle) shall be used in untested confined spaces or in any confined spaces immediately dangerous to life or health.
14. Where air-moving equipment is used to provide ventilation, chemicals shall be removed from the vicinity to prevent introduction into the confined space.
15. Vehicles shall not be left running near confined space work or near air-moving equipment being used for confined space ventilation.
16. Any deviation from the procedure requires the prior written permission of the Health and Safety Department.

D. Procedure for Confined Space Entry Permits (CSEP)

The Supervisor shall:

1. Evaluate the job to be done and identify the potential hazards before a job in a confined space is scheduled.
2. Ensure that all process piping, mechanical or electrical equipment, etc., have been disconnected, purged, blanked off or locked and tagged as necessary.
3. If possible, ensure removal of any standing fluids, i.e., solvents or chemicals, that may produce toxic or air displacing gases, vapors, or dust.
4. Initiate a Confined Space Entry Permit (CSEP) by completing the top portion of the permit in concurrence with the Health and Safety Department or its designated representative.
5. Ensure that any hot work (welding, burning, open flames, or spark producing operation) that is to be performed in the confined space has a approved Burning and Welding Permit from the local Security/Fire Protection representative.
6. Ensure that the space is ventilated at least 2 hours before starting work in the confined space and for the duration of time that work is to be performed in this space.
7. Ensure that personnel who enter the confined space and the confined space observer are familiar with the contents and requirements of this instruction.

The Health and Safety Department or its designated representative shall:

1. Perform remote (without entering) atmospheric testing of the confined space prior to employee entry and before validation/revalidation of a CSEP to ensure the following:
 - a. Oxygen content between 19.5 - 23.0%.
 - b. No concentration of combustible gas in the space. (Sampling will be done throughout the confined space and specifically at the lowest point in the space).
 - c. The absence of other atmospheric contaminants, if the space contained material of a toxic, corrosive, or irritant nature.
 - d. If remote testing is not possible, the individual must wear respiratory equipment as referenced in IV. M. above. ?
2. Designate whether hot work or cold work will be allowed. (Hot Work requires a Welding and Burning Permit). If all tests in V. B. 1. a. through c. are satisfactory, complete the CSEP listing any safety precautions, protective equipment, or other requirements.
3. Ensure that the top copy of the CSEP is visibly posted at the entrance to the confined space, a copy furnished to the requesting

supervisor, and a copy filed in the Health and Safety Office.

4. Perform if necessary, periodic tests of the atmosphere within the confined space during the course of work.

In some cases an employee in the confined space may be required to wear a personal, combustible gas/oxygen monitoring device equipped with an audible alarm to warn of deficient atmosphere. If so required, instruction regarding the operation of the equipment and other precautions will be given.

The CSEP shall be considered void if work in the confined space does not start within one hour after the tests done in V. B. 1. are performed or if significant changes within the confined space atmosphere or job scope occurs.

The CSEP posted at the confined space site shall be removed by the Health and Safety Department (or designee) at the completion of the job or the end of the shift, whichever is first. Health and Safety (or designee) shall date, record the time and sign the form in the lower right hand corner, and file for record maintenance.

E. Confined Space Observer and Helper

1. While personnel are inside the confined space, a confined space observer will monitor the activities and provide external assistance to those in the space. The observer will have no other duties which may take his attention away from the work or require him to leave the vicinity of the confined space at any time while personnel are in the space.
2. An observer shall maintain at least voice contact with all personnel in the confined space. Visual contact is preferred, if possible.
3. The observer shall be instructed by his/her supervisor in the method for contacting rescue personnel in the event of an emergency.
4. If irregularities inside the space are detected by the observer, personnel inside the space will be ordered to exit.
5. In the event of an emergency, the observer must NEVER enter the confined space prior to contacting and receiving assistance from a helper. Prior to this time, he should attempt to remove personnel with the lifeline and to perform all other rescue functions from outside the space.
6. The helper is designated to provide assistance to the confined space observer in case the observer must enter the confined space to receive personnel.

F. Personal Protective Equipment

1. The entry of any employee into a confined space requires that the employee utilize positive pressure respiratory equipment. This may be in the form of either SCBA or airline respirators with approved escape device.
2. Under no circumstances shall air purifying respirators be worn during a confined space entry.
3. Other protective equipment, such as clothing, gloves and ear protection shall be determined on a site specific/task specific basis. Clothing and equipment that do not produce static electricity shall be used.

ON SITE MATERIALS

	1	2	3	4	5	
	CHEMICAL SUBSTANCE	OSHA PEL (OR TLV)	TARGET ORGAN(S)	EXPOSURE SYMPTOMS	PHYSICAL HAZARDS / COMPATIBILITIES	
1	XYLENE	100 PPM	CENTRAL NERV SYS, EYES, GI TRACT, BLOOD, LIVER, KID- NEYS, SKIN	DIZZINESS, EXCITEMENT, DROWSINESS, EYE, NOSE, THROAT IRRITATION	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS	1
2						2
3						3
4						4
5						5
6						6
7						7
8						8
9						9
10						10
11	FORMALDEHYDE	3 PPM	RESP SYST, LUNGS, EYES, SKIN	EYE, NOSE, THROAT IRRITATION	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS, ALKALIES, ACIDS, PEROXIDES, UREA	11
12						12
13						13
14						14
15	SULFURIC ACID	1 MG/M ³	RESP SYST, EYES, SKIN, LUNGS	EYE, NOSE, THROAT IRRITATION SKIN BURNS	WATER REACTIVE FLAMMABLE / POISONOUS GASES MAY EVOLVE	15
16						16
17						17
18						18
19	HYDROGEN CHLORIDE	5 PPM (CEILING)	RESP SYST, LUNGS, SKIN EYES	EYE, NOSE, THROAT IRRITATION SKIN BURNS	WATER REACTIVE FLAMMABLE / POISONOUS GASES MAY EVOLVE	19
20						20
21						21
22						22
23	NAPHTHA	100 PPM	RESP SYST, EYES, SKIN	LIGHT HEADED, DROVEY, EYE, NOSE, THROAT IRRIT.	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS	23
24						24
25						25
26						26
27	SODIUM HYDROXIDE	2 MG/M ³	EYES RESP SYST, SKIN LUNGS	EYE, NOSE, THROAT IRRIT. SKIN BURNS, PNEUMONITIS	FLAMMABLE / POISONOUS GASES MAY EVOLVE WATER REACTIVE	27
28						28
29						29
30						30

BUTYL
ALCOHOL

100 PPM

SKIN, EYES,
RESP. SYST

HEADACHE,
DIZZINESS,
DROWSINESS
EYE, NOSE
THROAT IRRIT

FLAMMABLE
INCOMPATIBLE W/
OXIDIZERS

PROPYL
ALCOHOL

SKIN, EYES
RESP SYST

FLAMMABLE

TRIMETHYL
AMMONIUM
CHLORIDE

DIZZINESS

2 ETHOXY
ETHANOL

DIKETONE
ALCOHOL

50 PPM

EYE, SKIN, EYE, NOSE,
RESP SYST THROAT
IRRIT
SKIN IRRIT

COMBUSTIBLE
INCOMPATIBLE W/
OXIDIZERS,
ALKALIES

CHEMICAL SUBSTANCE	OSHA PEL (TLV)	TARGET ORGAN(S)	EXPOSURE SYMPTOMS	PHYSICAL HAZARDS/COMPATIBILITY
PROPANOL	200PPM	SKIN, EYES, RESP SYST GI TRACT	IRRIT EYES NOSE, THROAT DRY SKIN	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS
ACETIC ACID	10 PPM	RESP SYST, LUNGS, SKIN, EYES	IRRIT EYES NOSE, THROAT SKIN BURNS	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS, CHROMIC ACID, SODIUM PEROXIDE, NITRIC ACID, CAUSTICS
ZIRCONIUM ACETATE				
ETHANOL	1,000PPM	EYES, SKIN CNS	EYE, SKIN IRRIT DIZZINESS, SUFFOCATION	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS
FORMIC ACID	5PPM	RESP SYST, LUNGS, SKIN KIDNEYS, LIVER, EYES	EYE IRRIT NOSE, THROAT IRRIT, SKIN BURNS	WATER REACTIVE FLAMMABLE / POISON OUS GASES MAY EVOLVE INCOMPATIBLE W/ OXIDIZERS CAUSTICS, SULFURIC ACID
ISOPROPANOL	700PPM	EYE, SKIN, RESP SYST.	EYE, NOSE, THROAT IRRIT DROWSINESS, DIZZINESS	FLAMMABLE INCOMPATIBLE W/ OXIDIZERS
TRIMETHYL AMMONIUM CHLORIDE				

CHEMICAL SUBSTANCE	OSHA PEL (TLV)	TARGET ORGAN(S)	EXPOSURE SYMPTOMS	PHYSICAL HAZARDS/COMPATIBILITY
METHYL NAPHTHALENE *(NAPHTHALENE DATA)	(10 PPM)	(EYES, BLOOD, LIVER, KIDNEYS, SKIN, CNS)	(EYE IRRIT, HEADACHE, CONFUSION, EXCITEMENT, NAUSEA)	(COMBUSTIBLE INCOMPATIBLE W/ OXIDIZERS)
BIPHENYL	0.2 PPM	LIVER, SKIN, CNS, RESP SYST, EYES	EYE, THROAT IRRIT, HEAD- ACHE, NAUSEA LIVER DAMAGE	COMBUSTIBLE INCOMPATIBLE W/ OXIDIZERS
CHLORO TOLUENE	(50 PPM)	RESP SYST, LUNGS, SKIN EYES		COMBUSTIBLE
DIMETHYL PHTHALATE	5 MG/M ³	RESP SYST, GI TRACT	EYE, NOSE, THROAT IRRIT	COMBUSTIBLE INCOMPATIBLE W/ NITRATES, OXIDIZERS, ALKALIES, ACIDS
CYCLOHEXANONE	50 PPM	RESP SYST, EYES, SKIN CNS	EYE, NOSE THROAT IRRIT, CNS,	OXIDIZANT COMBUSTIBLE INCOMPATIBLE W/ OXIDIZING AGENTS; NITRIC ACID
PERCHLOROETHYLENE	100 PPM	LIVER, KIDNEYS, EYES, RESP SYST, CNS	EYE, NOSE, THROAT IRRIT, NAUSEA, LIVER DAMAGE	INCOMPATIBLE W/ OXIDIZERS, BARIUM, LITHIUM, BERYLLIUM
TITANIUM DIOXIDE	15 MG/M ³	LUNGS	LUNG FIBROSIS	NONE

TRICHLORO
ETHYLENE

100 PPM

RESP SYST,
HEART, LIVER,
KIDNEYS,
CNS, SKIN

HEADACHE,
DIZZINESS,
TREMORS,

NAUSEA, VOMIT.
EYE IRRIT. HEART
PROBLEMS

INCOMPATIBLE W/ CAUSTICS
SOME METALLS

37
38
39
40
41
42
43
44
45
46
47

CHEMICAL SUBSTANCE	OSHA PEL (TW)	TARGET ORGAN(S)	EXPOSURE SYMPTOMS	PHYSICAL HAZARDS/ INCOMPATIBILITIES
METHYL CHLOROFORM	350 PPM	SKIN, CNS, HEART, EYES	HEADACHE, DROWSINESS EYE IRRIT. HEART PROB.	INCOMPATIBLE W/ CAUSTICS, OXIDIZERS, METALS
AMMONIA	50 PPM	LUNGS, RESP SYST, EYES	EYE, NOSE, THROAT IRRIT CHEST PAIN, SKIN BURNS	INCOMPATIBLE W/ OXIDIZERS, CALCIUM, BLEACH, GOLD, MERCURY, SILVER, HALOGENS
DIETHANOLAMINE	10 PPM	RESP SYST, SKIN, EYES	NAUSEA, VOMIT, RESP IRRIT, SKIN, EYE IRRIT	COMBUSTIBLE INCOMPATIBLE W/ OXIDIZERS, ACIDS
PROPYLENE IMINE	2 PPM	EYES, SKIN	EYE, SKIN BURNS	FLAMMABLE INCOMPATIBLE W/ ACIDS, OXIDIZERS
DIMETHYL FORMAMIDE	10 PPM (30 Mg/M ³)	LIVER KIDNEYS LUS SKIN	NAUSEA, VOMIT COLEIC; WEIGHT FACE FLUSH DERMATITIS	INCOMPATIBLE W/ ① HALOGENATED COMPOUNDS ② IRON ③ STRONG OXIDIZERS ④ ALKYL ALUMINUMS

CHEMICAL SUBSTANCE	OSHA PEL (OR TLV)	TARGET ORGAN(S)	EXPOSURE SYMPTOMS	PHYSICAL HAZARDS AND/OR COMPATIBILITY
VINYL CHLORIDE	1 ppm	LIVER, CNS BLOOD RESP SYS. LYMPHATIC SYS.	WEAKNESS GUM BLEEDING ABDOMINAL PAIN PALLOR/CYANOSIS OF EXTREMITIES	
PERCHLORIC ACID		RESP. SYSTEM LUNGS, SKIN, EYES	SKIN IRRITANT LUNG IRRITANT	STRONG OXIDIZER IGNITES VIGOROUSLY W/O ORGANIC MATERIAL
CARBON TETRACHLORIDE	10 ppm	CNS, EYES LUNGS, LIVER KIDNEYS, SKIN	CNS DEPRESSION NAUSEA, VOMITING SKIN IRRITANT	CHEMICALLY ACTIVE COMPOUNDS (I.E. SODIUM MAGNESIUM POTASSIUM)
ASBESTOS	0.2 FIBERS/CC (0.1 ACTION LEVEL)	LUNGS	RESTRICTED PULMONARY FUNCTION FINGER CLUBBING DYSPNEA	

SITE ENTRY AND EXIT LOG

Work Site

Date

TIME

PERSONNEL

REPRESENTING

TIME

EQUIPMENT

In

Out

In

Out

Comments

HOT ZONE ENTRY AND EXIT LOG

Work Site

Date

TIME

PERSONNEL

LEVEL OF PROTECTION

In

Out

Comments